<table>
<thead>
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<th>Week 7-10</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
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<tbody>
<tr>
<td>Monday</td>
<td>Reading due</td>
<td>Groups</td>
<td>Beta due</td>
<td>Section</td>
<td>Progress report due</td>
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<td>Groups</td>
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<td>Midterm II</td>
<td>Reading</td>
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<td>Project Pres. II</td>
<td>Project Pres. III</td>
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<td>due</td>
<td>Project Pres. I</td>
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<td>Friday</td>
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</tbody>
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Memorial Day Holiday

Aspect-oriented design and programming ⇒ AspectJ
Join point

• A **join point** is a well-defined point in the control flow of a program
  – Immediately before (or after) a method execution starts (or finishes)
  – Object instantiations
  – Constructor executions
  – Field references
  – Handler executions
• Join points are execution-time notions – and each one is different even if it happens due to the exact same piece of source code in a program
Pointcut

• A pointcut defines – gives a name to – a set of join points
  - execution(void Point.setX(int))
  - handler(ArrayOutOfBoundException)
  - call(*.new(int, int))
  - execution(public !static * *(..))
  - pointcut setter(): target(Point) &&
    (call(void setX(int)) ||
     call(void setY(int)));

• That is, pointcuts are a way to identify a subset of join points in a program execution – a cross-cutting set of join points
advice

- Join points exist
- Pointcuts are defined
- But nothing happens until some code is provided that is to execute when a join point that is part of a pointcut is reached during execution
- That code is called advice
- AspectJ has three kinds of advice
  - Before
  - After
  - Around
Hello World